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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/658,861	09/08/00	YOSHITAKA	H 08038.0027

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EXAMINER

NGUYEN, H

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 08/15/01

Pleas find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/658,861

Applicant(s)

Yoshitaka

Examiner

Ha T. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) 1-3 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 4-9 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☒ Interview Summary (PTO-413) Paper No(s) 8.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Notice to applicant

1. Applicant's oral election of Group I, claims 4-9, without traverse on July 31, 01, is acknowledged. An affirmation to the oral election is required in the response to this Office Action. Claims 1-3 have been withdrawn from consideration.

Drawings

2. Figure 11 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

Claim Rejections - 35 USC § 112

3. Claims 4-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4, lines 3-4 recites the limitation "on which an active region is formed", it is not clear whether the active region is formed on the wiring or on the substrate. It appears that the active region is formed on the substrate. Substitution of "on which an active region is formed" with --the semiconductor substrate having an active region formed thereon-- is suggested.

Claims 5-9 variously depend from claim 4, they are rejected for the same reason.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhao et al., U.S. Patent 6100184 (Hereinafter Zhao) in view of Kato et al., U.S. Patent 5882826 (Hereinafter Kato).

Referring to figs. 1-11, Zhao discloses a method of fabricating a semiconductor device, said method comprising the steps of : forming a wiring layer 10 on a semiconductor substrate (See col. 4, lines 15-25), the semiconductor substrate having an active region formed thereon (See col. 5, lines 44-49) ; forming a first insulating layer 14 containing carbon on said wiring layer (See col. 6, lines 10-22); forming a second insulating layer 15 on said first insulating layer (see paragraph bridging cols. 5 and 6, and col. 6, lines 23-30); selectively etching said second insulating layer until the surface of said first insulating layer is partially exposed (See fig. 5); selectively etching said first insulating layer using said selectively-etched second insulating layer as a mask (See fig. 9); and forming a new wiring layer on said second insulating layer after selectively etching said first insulating layer (See fig. 11, # 29) .

But it does not disclose expressly a second insulating layer comprising silicon, carbon and nitrogen.

However, it is well known in the art because Kato discloses this feature (See abstract and fig. 3).

A person of ordinary skill is motivated to modify Zhao with Kato to obtain mask with good mechanical strength and optical transmittance (see Kato, col. 2, lines 23-27).

As to claim 5, the combined teaching of Zhao and Kato discloses substantially the limitations of claim 5, as shown above.

But it does not disclose expressly the addition of boron to the second insulating layer.

However, Kato also discloses the use of BN as mask layer (see col. 1, lines 45-49).

It would have been obvious for a person of ordinary skill in the art to use two materials having the same function to perform the same.

As to claim 6, Zhao discloses wherein said step of selectively etching said second insulating layer is carried out with the plasma of the gas of a compound containing carbon and fluorine (see paragraph bridging cols. 8 and 9).

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As to claim 7, Zhao discloses wherein said step of selectively etching said second insulating layer is carried out with the plasma of the gas of a compound containing carbon and fluorine (see col. 8, lines 2-5).

As to claim 8, Zhao discloses wherein said step of selectively etching said first insulating layer is carried out with the plasma of the gas of an oxygen-containing (see col. 7, lines 36-45).

Therefore, it would have been obvious to combine Zhao with Kato to obtain the invention as specified in claims 4-8.

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable Zhao in view of Kato, as applied to claims 4-8 above, and further in view of Chen et al., U.S. Patent 6211061 (Hereinafter Chen).

The combined teaching of Zhao and Kato discloses substantially the limitations of claim 9, as shown above.

But it does not disclose expressly the use of a plasma of a hydrogen-containing gas to selectively etch the first insulating layer.

However, it is well known in the art because Chen discloses the use of N_2/O_2 or N_2/H_2 to etch the organic low k dielectric material (See col. 6, lines 51-65).

A person of ordinary skill is motivated to modify Zhao and Kato with Chen because both O_2 and H_2 has the same effect in etching organic low k dielectric material.

Therefore, it would have been obvious to combine Zhao and Kato with Chen to obtain the invention as specified in claim 9 .

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ha Nguyen whose telephone number is (703)308-2706 . The examiner can normally be reached on Monday-Friday from 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Neibling, can be reached on (703) 308-3325. The fax phone number for this Group is (703) 308-7722.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

Patent Examiner



Ha Nguyen

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